



SEQUENCE LISTING

<110> Advisys
Baylor College of Medicine

<120> SYNTHETIC MUSCLE PROMOTERS WITH ACTIVITIES EXCEEDING NATURALLY OCCURRING
REGULATORY SEQUENCES IN CARDIAC CELLS

<130> 108328.00161 - AVSI-0027

<140> 10699597
<141> 2003-10-30

<150> US 60/423,536
<151> 2002-11-04

<160> 22

<170> PatentIn version 3.1

<210> 1
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<212> DNA
<213> artificial sequence

<220>
<223> SRE control elements used in the promoters.

<400> 1
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<213> artificial sequence

<220>
<223> MEF-1 control element used in the promoters

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ccaacacctg ctgctgcc 19

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<223> MEF-2 control element used in the promoters.

<400> 3
cgctctaaaa ataactccc 19

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<223> TEF-1 control element used in the promoters.

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caccattcct cac

13

<210> 5

<211> 335

<212> DNA

<213> artificial sequence

<220>

<223> Nucleic acid sequence of an eukaryotic promoter c5-12.

<400> 5

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aaaataactc ccgggagtta tttttagagc ggaggaatgg tggacacca aatatggcga 180

cggttcctca cccgtcgcca tatttggtg tccgccctcg gccggggccg cattcctggg 240

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gctacccgga ggagcgggag gcgccaagct ctaga 335

<210> 6

<211> 40

<212> PRT

<213> artificial sequence

<220>

<223> This is the artificial sequence for GHRH (1-40)OH.

<220>

<221> MISC_FEATURE

<222> (1)..(1)

<223> Xaa at position 1 may be tyrosine, or histidine

<220>

<221> MISC_FEATURE

<222> (2)..(2)

<223> Xaa at position 2 may be alanine, valine, or isoleucine.

<220>

<221> MISC_FEATURE

<222> (15)..(15)

<223> Xaa at position 15 may be alanine, valine, or isoleucine.

<220>

<221> MISC_FEATURE

<222> (27)..(27)

<223> Xaa at position 27 may be methionine, or leucine.

<220>
 <221> MISC_FEATURE
 <222> (28)..(28)
 <223> Xaa at position 28 may be serine or asparagine.

<400> 6

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Leu Ser Ala Arg Lys Leu Leu Gln Asp Ile Xaa Xaa Arg Gln Gln Gly
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Glu Arg Asn Gln Glu Gln Gly Ala
 35 40

<210> 7
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 <223> Nucleic acid sequence for the HV-GHRH plasmid.

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| tgggattcca ggcatgcatg accaggctca gctaattttt gtttttttgg tagagacggg | 1080 |
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| ccgctttcca gtcgggaaac ctgtcgtgcc agctgcatta atgaatcggc caacgcgcgg | 1620 |
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| accgtaaaaa ggccgcgttg ctggcgtttt tccataggct ccgccccctt gacgagcatc | 1860 |
| acaaaaatcg acgctcaagt cagagggtggc gaaacccgac aggactataa agataccagg | 1920 |
| cgtttcccc tggaaagctc ctctgtgcgt ctctgttcc gacctgccg cttaccggat | 1980 |
| acctgtccgc ctttctccct tcgggaagcg tggcgctttc tcatagctca cgctgtaggt | 2040 |
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| agcggccatt ttccaccatg atattcggca agcaggcatc gccatgggtc acgacgagat | 2700 |

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| agggcgcccc agctggcaat tccggttcgc ttgctgtcca taaaaccgcc cagtctagca | 3420 |
| actgttgggg agggcgatcg gtgcgggcct cttcgctatt acgccagctg gcgaaagggg | 3480 |
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<210> 8

<211> 3534

<212> DNA

<213> artificial sequence

<220>

<223> Nucleic acid sequence for the TI-GHRH plasmid.

<400> 8

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| tggcgctcta aaaataactc ccgggagtta ttttttagagc ggaggaatgg tggacaccca | 240 |
| aatatggcga cggttcctca ccgctcgcca tatttggttg tccgccctcg gccggggccg | 300 |
| cattcctggg ggccggggcg tgctcccgcc cgcctcgata aaaggctccg gggccggcgg | 360 |
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| ggcccaactc cccgaaccac tcagggtcct gtggacagct cacctagctg ccatggtgct | 480 |
| ctgggtgttc ttctttgtga tcctaccct cagcaacagc tcccactgct cccacctcc | 540 |
| ccctttgacc ctcaggatgc ggcggtatat cgatgccatc ttcaccaaca gctaccgga | 600 |
| ggtgctggcc cagctgtccg cccgcaagct gctccaggac atcctgaaca ggcagcagg | 660 |

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| ggtggcatcc ctgtgacccc tccccagtgc ctctcctggc cctggaagtt gccactccag | 780 |
| tgcccaccag ccttgtccta ataaaattaa gttgcatcat tttgtctgac taggtgtcct | 840 |
| tctataatat tatggggtgg aggggggtgg tatggagcaa ggggcaagtt gggaagacaa | 900 |
| cctgtagggc ctgcggggtc tattgggaac caagctggag tgcaaggcca caatcttggc | 960 |
| tcaactgcaat ctccgcctcc tgggttcaag cgattctcct gcctcagcct cccgagttgt | 1020 |
| tgggattcca ggcatgcatg accaggctca gctaattttt gtttttttgg tagagacggg | 1080 |
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| ggcctcccaa attgctggga ttacaggcgt gaaccactgc tcccttccct gtccttctga | 1200 |
| ttttaaaata actataccag caggaggacg tccagacaca gcataggcta cctggccatg | 1260 |
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| gaaaaaaagg atctcaagaa gatcctttga tcttttctac ggggtctgac gctcagaaga | 2460 |

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| actcgtcaag aaggcgatag aaggcgatgc gctgcgaatc gggagcggcg ataccgtaaa | 2520 |
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| agcgccatt ttccaccatg atattcggca agcaggcatc gccatgggtc acgacgagat | 2700 |
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| actgttggga agggcgatcg gtgcgggcct cttcgctatt acgccagctg gcgaaagggg | 3480 |
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<210> 9

<211> 3534

<212> DNA

<213> artificial sequence

<220>

<223> Nucleic acid sequence for the TV-GHRH plasmid.

<400> 9

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| gtgaggaatg gtggggagtt attttttagag cggtgaggaa ggtgggcagg cagcaggtgt | 180 |
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| cattcctggg ggccgggagg tgctcccgcc cgcctcgata aaaggctccg gggccggcgg | 360 |
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| cctgcgctga cagccggaac acggcggcat cagagcagcc gattgtctgt tgtgccagt | 3180 |
| catagccgaa tagcctctcc acccaagcgg ccggagaacc tgcgtgcaat ccatcttggt | 3240 |
| caatcatgcg aaacgatcct catcctgtct cttgatcaga tcttgatccc ctgcgccatc | 3300 |
| agatccttgg cggcaagaaa gccatccagt ttactttgca gggcttccca accttaccag | 3360 |
| agggcgcccc agctggcaat tccggttcgc ttgctgtcca taaaaccgcc cagtctagca | 3420 |
| actgttggga agggcgatcg gtgcgggcct cttcgctatt acgccagctg gcgaaagggg | 3480 |
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<210> 10

<211> 3534

<212> DNA

<213> artificial sequence

<220>

<223> Nucleic acid sequence for the 15/27/28 GHRH plasmid.

<400> 10

| | |
|--|-----|
| gttgtaaaac gacggccagt gaattgtaat acgactcact atagggcgaa ttggagctcc | 60 |
| accgcggtgg cggccgtccg ccctcggcac catcctcacg acacccaaat atggcgacgg | 120 |
| gtgaggaatg gtggggagtt attttttagag cggtgaggaa ggtgggcagg cagcaggtgt | 180 |

| | |
|--|------|
| tggcgctcta aaaataactc ccgggagtta ttttagagc ggaggaatgg tggacacca | 240 |
| aatatggcga cggttcctca cccgtcgcca tatttgggtg tccgccctcg gccggggccg | 300 |
| cattcctggg ggccgggccc tgctcccgcc cgcctcgata aaaggctccg gggccggcgg | 360 |
| cggcccacga gctaccggga ggagcgggag gcgccaagct ctagaactag tggatcccaa | 420 |
| ggcccaactc cccgaaccac tcagggtcct gtggacagct cacctagctg ccatggtgct | 480 |
| ctgggtgttc ttctttgtga tcctcaccct cagcaacagc tcccactgct cccacctcc | 540 |
| ccctttgacc ctcaggatgc ggcggtatat cgatgccatc ttcaccaaca gctaccggaa | 600 |
| ggtgctggcc cagctgtccg cccgcaagct gctccaggac atcctgaaca ggcagcagg | 660 |
| agagaggaac caagagcaag gagcataatg actgcaggaa ttcgatatca agcttatcgg | 720 |
| ggtggcatcc ctgtgacccc tccccagtgc ctctcctggc cctggaagtt gccactccag | 780 |
| tgcccaccag ccttgtccta ataaaattaa gttgcatcat tttgtctgac taggtgtcct | 840 |
| tctataatat tatgggggtg aggggggtg tatggagcaa ggggcaagtt gggaagacaa | 900 |
| cctgtagggc ctgcggggtc tattgggaac caagctggag tgcagtggca caatcttggc | 960 |
| tcactgcaat ctccgcctcc tgggttcaag cgattctcct gcctcagcct cccgagttgt | 1020 |
| tgggattcca ggcattgatg accaggctca gctaattttt gtttttttgg tagagacggg | 1080 |
| gtttcaccat attggccagg ctggtctcca actcctaate tcaggatgat taccacctt | 1140 |
| ggcctcccaa attgctggga ttacaggcgt gaaccactgc tcccttcctt gtccttctga | 1200 |
| ttttaaaata actataccag caggaggacg tccagacaca gcataggcta cctggccatg | 1260 |
| cccaaccggt gggacatttg agttgcttgc ttggcactgt cctctcatgc gttgggtcca | 1320 |
| ctcagtagat gcctgttgaa ttcgataccg tcgacctga gggggggccc ggtaccagct | 1380 |
| tttgttccct ttagtgaggg ttaatttcga gcttggcgta atcatggtca tagctgtttc | 1440 |
| ctgtgtgaaa ttgttatccg ctcaacaattc cacacaacat acgagccgga agcataaagt | 1500 |
| gtaaagcctg gggtgctaa tgagtgaact aactcacatt aattgcgttg cgctcactgc | 1560 |
| ccgctttcca gtcgggaaac ctgtcgtgcc agctgcatta atgaatcggc caacgcgcgg | 1620 |
| ggagaggcgg ttgctgtatt gggcgctctt ccgcttcctc gctcactgac tcgctgcgct | 1680 |
| cggtcgttcg gctgcggcga gcggtatcag ctactcaaa ggcggtataa cggttatcca | 1740 |
| cagaatcagg ggataacgca ggaaagaaca tgtgagcaaa aggccagcaa aaggccagga | 1800 |
| accgtaaaaa ggccgcgttg ctggcgtttt tccataggct ccgccccctt gacgagcatc | 1860 |
| acaaaaatcg acgctcaagt cagagggtggc gaaacccgac aggactataa agataccagg | 1920 |
| cgtttcccc tggaagctcc ctctgctgct ctctgttcc gaccctgccg cttaccggat | 1980 |

| | |
|--|------|
| acctgtccgc ctttctccct tcgggaagcg tggcgctttc tcatagctca cgctgtaggt | 2040 |
| atctcagttc ggtgtaggtc gttcgctcca agctgggctg tgtgcacgaa cccccggtc | 2100 |
| agcccgaccg ctgcgcccta tccggttaact atcgtcttga gtccaacccg gtaagacacg | 2160 |
| acttatcgcc actggcagca gccactggta acaggattag cagagcgagg tatgtaggcg | 2220 |
| gtgctacaga gttcttgaag tggtaggcta actacggcta cactagaaga acagtatttg | 2280 |
| gtatctgcgc tctgctgaag ccagttacct tcggaaaaag agttggtagc tcttgatccg | 2340 |
| gcaaaaaac caccgctggt agcggtggtt tttttgttg caagcagcag attacgcgca | 2400 |
| gaaaaaaagg atctcaagaa gatcctttga tcttttctac ggggtctgac gctcagaaga | 2460 |
| actcgtcaag aaggcgatag aaggcgatgc gctgcgaatc gggagcggcg ataccgtaaa | 2520 |
| gcacgaggaa gcggtcagcc cattcgccgc caagctcttc agcaatatca cgggtagcca | 2580 |
| acgctatgtc ctgatagcgg tccgccacac ccagccggcc acagtcgatg aatccagaaa | 2640 |
| agcggccatt ttccaccatg atattcggca agcaggcatc gccatgggtc acgacgagat | 2700 |
| cctcgccgtc gggcatgcgc gccttgagcc tggcgaacag ttcggctggc gcgagccct | 2760 |
| gatgctcttc gtccagatca tctgatcga caagaccggc ttccatccga gtacgtgctc | 2820 |
| gctcgatgcg atgtttcgct tggtaggctga atgggcaggc agccggatca agcgtatgca | 2880 |
| gccgccgcat tgcattcagcc atgatggata ctttctcggc aggagcaagg tgagatgaca | 2940 |
| ggagatcctg ccccggcact tcgccaata gcagccagtc ccttcccgtc tcagtgacaa | 3000 |
| cgtcgagcac agctgcgcaa ggaacgcccg tcgtggccag ccacgatagc cgcgctgcct | 3060 |
| cgtcctgcag ttcatcagc gcaccggaca ggtcggctctt gacaaaaaga accgggcgcc | 3120 |
| cctgcgctga cagccggaac acggcggcat cagagcagcc gattgtctgt tgtgcccagt | 3180 |
| catagccgaa tagcctctcc acccaagcgg ccggagaacc tgcgtgcaat ccatcttggt | 3240 |
| caatcatgcg aaacgatcct catcctgtct cttgatcaga tcttgatccc ctgcgccatc | 3300 |
| agatccttgg cggcaagaaa gccatccagt ttactttgca gggcttccca accttaccag | 3360 |
| agggcgcccc agctggcaat tccggttcgc ttgctgtcca taaaaccgcc cagtctagca | 3420 |
| actgttggga agggcgatcg gtgcgggcct cttcgctatt acgccagctg gcgaaagggg | 3480 |
| gatgtgctgc aaggcgatta agttgggtaa cgccagggtt ttcccagtca cgac | 3534 |

<210> 11
 <211> 2710
 <212> DNA
 <213> artificial sequence
 <220>

<223> Vector with a mouse codon optimized GHRH analog sequence

<400> 11

| | |
|---|------|
| tgtaatacga ctcactatag ggcgaattgg agctccaccg cggtaggcggc cgtccgccct | 60 |
| cggcaccatc ctcacgacac ccaaatatgg cgacgggtga ggaatggtgg ggagttat | 120 |
| ttagagcggg gaggaagggt ggcaggcagc aggtgttggc gctctaaaaa taactcccgg | 180 |
| gagttat | 240 |
| tcgccatatt tgggtgtccg ccctcggccg gggccgcatt cctggggggc gggcgggtgct | 300 |
| cccggccgcc tcgataaaag gctccggggc cggcggcggc ccacgagcta cccggaggag | 360 |
| cgggaggcgc caagcggatc ccaaggccca actccccgaa ccactcaggg tcctgtggac | 420 |
| agctcaccta gctgccatgg tgctctgggt gctctttgtg atcctcatcc tcaccagcgg | 480 |
| cagccactgc agcctgcctc ccagccctcc cttcaggatg cagaggcacg tggacgccat | 540 |
| cttcaccacc aactacagga agctgctgag ccagctgtac gccaggaagg tgatccagga | 600 |
| catcatgaac aagcagggcg agaggatcca ggagcagagg gccaggctga gctgataagc | 660 |
| ttatcggggg ggcacccctg tgacccctcc ccagtgcctc tcctggccct ggaagttgcc | 720 |
| actccagtgc ccaccagcct tgctctaata aaattaagtt gcatcatttt gtctgactag | 780 |
| gtgtccttct ataataattat ggggtggagg ggggtgggtat ggagcaaggg gcaagttggg | 840 |
| aagacaacct gtagggctcg agggggggcc cggtagccagc ttttggtccc tttagtgagg | 900 |
| gttaatttcg agcttggtct tccgcttctc cgctcactga ctgctgcgc tcggtcgttc | 960 |
| ggctgcggcg agcggtatca gctcactcaa aggcggtaat acggttatcc acagaatcag | 1020 |
| gggataacgc aggaaagaac atgtgagcaa aaggccagca aaaggccagg aaccgtaaaa | 1080 |
| aggccgcgtt gctggcggtt tcccataggc tccgcccccc tgacgagcat cacaaaaatc | 1140 |
| gacgctcaag tcagagggtg cgaaaccgga caggactata aagataccag gcgtttcccc | 1200 |
| ctggaagctc cctcgtgcgc tctcctgttc cgaccctgcc gcttaccgga tacctgtccg | 1260 |
| cctttctccc ttcgggaagc gtggcgcttt ctcatagctc acgctgtagg tatctcagtt | 1320 |
| cgggtgtaggt cgttcgtcc aagctgggct gtgtgcacga acccccgtt cagcccagcc | 1380 |
| gctgcgcctt atccggtaac tategtcttg agtccaaccc ggtaagacac gacttatcgc | 1440 |
| cactggcagc agccactggt aacaggatta gcagagcgag gtatgtaggc ggtgctacag | 1500 |
| agttcttgaa gtgggtggcct aactacggct acactagaag aacagtat | 1560 |
| ctctgctgaa gccagttacc ttcggaaaaa gagttggtag ctcttgatcc ggcaaaaaa | 1620 |
| ccaccgctgg tagcgggtgg ttttttgttt gcaagcagca gattacgcgc agaaaaaaag | 1680 |
| gatctcaaga agatcctttg atcttttcta cggggctagc gcttagaaga actcatccag | 1740 |

| | |
|--|------|
| cagacggtag aatgcaatac gttgagagtc tggagctgca ataccataca gaaccaggaa | 1800 |
| acggtcagcc cattcaccac ccagttcctc tgcaatgtca cgggtagcca gtgcaatgtc | 1860 |
| ctggtaacgg tctgcaacac ccagacgacc acagtcaatg aaaccagaga aacgaccatt | 1920 |
| ctcaaccatg atgttcggca ggcattgcac accatgagta actaccaggt cctcaccatc | 1980 |
| cggcatacga gctttcagac gtgcaaacag ttcagccggg gccagaccct gatgttcctc | 2040 |
| atccaggtca tcctgggtcaa ccagacctgc ttccatacgg gtacgagcac gttcaatacg | 2100 |
| atgttttgcc tgggtgggtcaa acggacaggt agctgggtcc aggggtgtgca gacgacgcat | 2160 |
| tgcatcagcc atgatagaaa ctttctctgc cggagccagg tgagaagaca gcaggtcctg | 2220 |
| acccggaact tcacccagca gcagccagtc acgaccagct tcagtaacta catccagaac | 2280 |
| tgcagcacac ggaacaccag tggttgccag ccaagacaga cgagctgctt catcctgcag | 2340 |
| ttcattcaga gcaccagaca ggtcagtttt aacaaacaga actggacgac cctgtgcaga | 2400 |
| cagacggaaa acagctgcat cagagcaacc aatgggtctgc tgtgcccagt cataaccaa | 2460 |
| cagacgttca acccagggtg ccggagaacc tgcatgcaga ccatcctgtt caatcatgcg | 2520 |
| aaacgatcct catcctgtct ctgatcaga tcttgatccc ctgcgccatc agatccttgg | 2580 |
| cggcaagaaa gccatccagt ttactttgca gggcttccca accttaccag agggcgcccc | 2640 |
| agctggcaat tccggttcgc ttgctgtcca taaaaccgcc cagtctagca actgttggga | 2700 |
| agggcgatcg | 2710 |

<210> 12
 <211> 2713
 <212> DNA
 <213> artificial sequence

<220>
 <223> Vector with a rat codon optimized GHRH analog sequence

| | |
|---|-----|
| <400> 12 | |
| tgtaatacga ctactatag ggcgaattgg agtccaccg cgggtggcggc cgtccgccct | 60 |
| cggcaccatc ctcacgacac ccaaatatgg cgacgggtga ggaatgggtg ggagttat | 120 |
| ttagagcggg gaggaagggt ggcaggcagc aggtgttggc gctctaaaaa taactcccgg | 180 |
| gagttat | 240 |
| tcgccatatt tgggtgtccg cctcggccg gggccgcatt cctgggggcc gggcgggtgct | 300 |
| cccggccgcc tcgataaaag gctccggggc cggcggcggc ccacgagcta cccggaggag | 360 |
| cgggaggcgc caagcggatc ccaaggccca actccccgaa ccactcaggg tcctgtggac | 420 |
| agctcaccta gctgcatgg cctgtgggt gttcttcgtg ctgctgacct tgaccagcgg | 480 |

| | |
|--|------|
| aagccactgc agcctgcctc ccagccctcc cttcagggtg cgccggcacg ccgacgccat | 540 |
| cttcaccagc agctacagga ggatcctggg ccagctgtac gctaggaagc tcctgcacga | 600 |
| gatcatgaac aggcagcagg gcgagaggaa ccaggagcag aggagcaggt tcaactgata | 660 |
| agcttatcgg ggtggcatcc ctgtgacccc tcccagtg ctcctcctggc cctggaagtt | 720 |
| gccactccag tgcccaccag ccttgtccta ataaaattaa gttgcatcat tttgtctgac | 780 |
| taggtgtcct tctataatat tatgggggtg aggggggtg tatggagcaa ggggcaagtt | 840 |
| gggaagacaa cctgtagggc tcgagggggg gcccggtacc agcttttggt cccttttagtg | 900 |
| agggttaatt tcgagcttg tcttcgctt cctcgctcac tgactcgctg cgctcggtcg | 960 |
| ttcggctgcg gcgagcggta tcagctcact caaaggcggg aatacgggta tccacagaat | 1020 |
| caggggataa cgcaggaaag aacatgtgag caaaaggcca gcaaaaggcc aggaaccgta | 1080 |
| aaaaggccgc gttgctggcg tttttccata ggctccgccc ccctgacgag catcacaaaa | 1140 |
| atcgacgctc aagtcagagg tggcgaaacc cgacaggact ataaagatac caggcgtttc | 1200 |
| cccctggaag ctccctcgtg cgctctcctg ttccgaccct gccgcttacc ggatacctgt | 1260 |
| ccgcctttct cccttcggga agcgtggcgc tttctcatag ctcacgctgt aggtatctca | 1320 |
| gttcggtgta ggtcgttcgc tccaagctgg gctgtgtgca cgaaccccc gttcagcccc | 1380 |
| accgctgcgc cttatccggg aactatcgtc ttgagtccaa cccggtaaga cacgacttat | 1440 |
| cgccactggc agcagccact ggtaacagga ttagcagagc gaggtatgta ggcggtgcta | 1500 |
| cagagttctt gaagtgggtg cctaactacg gctacactag aagaacagta tttggatatct | 1560 |
| gcgctctgct gaagccagtt accttcggaa aaagagttgg tagctcttga tccggcaaac | 1620 |
| aaaccaccgc tggtagcggg ggtttttttg tttgcaagca gcagattacg cgagaaaaa | 1680 |
| aaggatctca agaagatcct ttgatctttt ctacggggct agcgcttaga agaactcatc | 1740 |
| cagcagacgg tagaatgcaa tacgttgaga gtctggagct gcaataccat acagaaccag | 1800 |
| gaaacgggta gcccatcac caccagttc ctctgcaatg tcacgggtag ccagtgcaat | 1860 |
| gtcctggtaa cggctctgcaa caccagacg accacagtca atgaaaccag agaaacgacc | 1920 |
| attctcaacc atgatgttcg gcaggcatgc atcaccatga gtaactacca ggtcctcacc | 1980 |
| atccggcata cgagctttca gacgtgcaaa cagttcagcc ggtgccagac cctgatgttc | 2040 |
| ctcatccagg tcatcctggg caaccagacc tgcttcata cgggtacgag cacgttcaat | 2100 |
| acgatgtttt gcctgggtgg caaacggaca ggtagctggg tccagggtgt gcagacgacg | 2160 |
| cattgcatca gccatgatag aaactttctc tgccggagcc aggtgagaag acagcaggtc | 2220 |
| ctgacccgga acttcacca gcagcagcca gtcacgacca gcttcagtaa ctacatccag | 2280 |

| | |
|---|------|
| aactgcagca cacggaacac cagtgggtgc cagccaagac agacgagctg cttcatcctg | 2340 |
| cagttcatte agagcaccag acaggtcagt tttaacaaac agaactggac gaccctgtgc | 2400 |
| agacagacgg aaaacagctg catcagagca accaatggtc tgctgtgccc agtcataacc | 2460 |
| aaacagacgt tcaacccagg ctgccggaga acctgcatgc agaccatcct gttcaatcat | 2520 |
| gcgaaacgat cctcatcctg tctcttgatc agatcttgat cccctgcgcc atcagatcct | 2580 |
| tggcggcaag aaagccatcc agtttacttt gcagggcttc ccaaccttac cagagggcgc | 2640 |
| cccagctggc aattccggtt cgcttgctgt ccataaaacc gcccagtcta gcaactgttg | 2700 |
| ggaagggcga tcg | 2713 |

<210> 13
 <211> 2704
 <212> DNA
 <213> artificial sequence

<220>
 <223> Vector with a bovine codon optimized GHRH analog sequence

| | |
|--|------|
| <400> 13 | |
| tgtaatacga ctactatag ggcgaattgg agctccaccg cggtaggcggc cgtccgcctt | 60 |
| cggcaccatc ctacgacac ccaaatatgg cgacgggtga ggaatggtgg ggagttattt | 120 |
| ttagagcggg gaggaagggtg ggcaggcagc aggtgttggc gctctaaaaa taactccccg | 180 |
| gagttatttt tagagcggag gaatggtgga caccctaaata tggcgacggg tcctcacccg | 240 |
| tcgccatatt tgggtgtccg ccctcggccg gggccgcatt cctggggggc gggcgggtgct | 300 |
| cccgcccgcc tcgataaaag gctccggggc cggcggcggc ccacgagcta cccggaggag | 360 |
| cgggagggcg caagcggatc ccaaggccca actccccgaa ccactcaggg tcctgtggac | 420 |
| agctcaccta gctgccatgg tgctgtgggt gttcttcctg gtgaccctga ccctgagcag | 480 |
| cggctcccac ggctccctgc cctcccagcc tctgcgcac cctcgctacg ccgacgccat | 540 |
| cttcaccaac agctaccgca aggtgctcgg ccagctcagc gcccgcaagc tcctgcagga | 600 |
| catcatgaac cggcagcagg gcgagcgcaa ccaggagcag ggagcctgat aagcttatcg | 660 |
| gggtggcatc cctgtgacct ctccccagtg cctctcctgg ccctggaagt tgccactcca | 720 |
| gtgcccacca gccttgctct aataaaatta agttgcatca tttgtctga ctaggtgtcc | 780 |
| ttctataata ttatgggggtg gaggggggtg gtagggagca aggggcaagt tgggaagaca | 840 |
| acctgtaggg ctcgaggggg gggccgggtac cagcttttgt tccctttagt gagggttaat | 900 |
| ttcgagcttg gtcttcgct tcctcgctca ctgactcgct gcgctcggtc gttcgggtgc | 960 |
| ggcgagcggg atcagctcac tcaaaggcgg taatacgggt atccacagaa tcaggggata | 1020 |

| | |
|--|------|
| acgcaggaaa gaacatgtga gcaaaaggcc agcaaaaggc caggaaccgt aaaaaggccg | 1080 |
| cgttgctggc gtttttccat aggtccgcc cccctgacga gcatcacaaa aatcgacgct | 1140 |
| caagtcagag gtggcgaaac ccgacaggac tataaagata ccaggcgttt cccctggaa | 1200 |
| gtccctcgt gcgctctcct gttccgaccc tgccgcttac cggatacctg tccgccttcc | 1260 |
| tcccttcggg aagcgtggcg ctttctcata gtcacgctg taggtatctc agttcggtgt | 1320 |
| aggtcgttcg ctccaagctg ggctgtgtgc acgaaccccc cgttcagccc gaccgctgcg | 1380 |
| ccttatccgg taactatcgt cttgagtcca acccggttaag acacgactta tcgccactgg | 1440 |
| cagcagccac tggtaacagg attagcagag cgaggatatgt aggcggtgct acagagttct | 1500 |
| tgaagtgggt gcctaactac ggctacacta gaagaacagt atttggtatc tgcgctctgc | 1560 |
| tgaagccagt taccttcgga aaaagagttg gtagctcttg atccggcaaa caaaccaccg | 1620 |
| ctggtagcgg tggttttttt gtttgcaagc agcagattac gcgcagaaaa aaaggatctc | 1680 |
| aagaagatcc tttgatcttt tctacggggc tagcgcttag aagaactcat ccagcagacg | 1740 |
| gtagaatgca atacgttgag agtctggagc tgcaatacca tacagaacca ggaaacggtc | 1800 |
| agccattca ccaccagtt cctctgcaat gtcacgggta gccagtgcaa tgtcctggta | 1860 |
| acggctctgca acaccagac gaccacagtc aatgaaacca gagaaacgac cattctcaac | 1920 |
| catgatgttc ggcaggcatg catcaccatg agtaactacc aggtcctcac catccggcat | 1980 |
| acgagctttc agacgtgcaa acagttcagc cgggtgccaga cctgatgtt cctcatccag | 2040 |
| gtcatcctgg tcaaccagac ctgcttccat acgggtacga gcacgttcaa tacgatgttt | 2100 |
| tgcttggtgg tcaaacggac aggtagctgg gtccagggtg tgcagacgac gcattgcac | 2160 |
| agccatgata gaaactttct ctgccggagc caggtgagaa gacagcaggt cctgacccgg | 2220 |
| aacttcaccc agcagcagcc agtcacgacc agcttcagta actacatcca gaactgcagc | 2280 |
| acacggaaca ccagtgggtg ccagccaaga cagacgagct gcttcacct gcagttcatt | 2340 |
| cagagcacca gacaggtcag ttttaacaaa cagaactgga cgaccctgtg cagacagacg | 2400 |
| gaaaacagct gcatcagagc aaccaatggc ctgctgtgcc cagtcataac caaacagacg | 2460 |
| ttcaaccag gctgccggag aacctgcatg cagaccatcc tgttcaatca tgcgaaacga | 2520 |
| tcctcatcct gtctcttgat cagatcttga tcccctgcgc catcagatcc ttggcgga | 2580 |
| gaaagccatc cagtttactt tgcagggtt cccaacctta ccagagggcg cccagctgg | 2640 |
| caattccggt tcgcttgctg tccataaaac cgcccagtct agcaactgtt gggaagggcg | 2700 |
| atcg | 2704 |

<210> 14
<211> 2704
<212> DNA
<213> artificial sequence

<220>
<223> Vector with a ovine codon optimized GHRH analog sequence

<400> 14
tgtaatacga ctactatag ggcgaattgg agctccaccg cggtaggcggc cgtccgccct 60
cggcaccatc ctcacgacac ccaaatatgg cgacgggtga ggaatgggtg ggagttattt 120
ttagagcggg gaggaagggt ggcaggcagc aggtgttggc gctctaaaaa taactcccgg 180
gagttatttt tagagcggag gaatgggtga caccctaaata tggcgacggg tcctcaccgg 240
tcgccatatt tgggtgtccg ccctcggccg gggccgcatt cctggggggc gggcgggtgt 300
cccgcccgcc tcgataaaag gctccggggc cggcggcgcc ccacgagcta cccggaggag 360
cgggaggcgc caagcggatc ccaaggccca actccccgaa cactcagggt tcctgtggac 420
agctcaccta gctgccatgg tgctgtgggt gttcttctctg gtgaccctga ccctgagcag 480
cggaagccac ggcagcctgc ccagccagcc cctgaggatc cctaggtacg ccgacgcat 540
cttcaccaac agctacagga agatcctggg ccagctgagc gctaggaagc tcctgcagga 600
catcatgaac aggcagcagg gcgagaggaa ccaggagcag ggcgcctgat aagcttatcg 660
gggtggcatc cctgtgacct ctccccagtg cctctcctgg ccctggaagt tgccactcca 720
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acctgtaggg ctcgagggggg ggcccggtag cagcttttgt tcccttttagt gaggggttaat 900
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ggcgagcggg atcagctcac tcaaaggcgg taatacggtt atccacagaa tcaggggata 1020
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cgttgctggc gtttttccat aggtccgcc ccctgacga gcatcacaaa aatcgacgct 1140
caagtcagag gtggcgaaac ccgacaggac tataaagata ccaggcgttt cccctggaa 1200
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tcccttcggg aagcgtggcg ctttctcata gctcacgctg taggtatctc agttcgggtgt 1320
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ccttatccgg taactatcgt cttgagtcca acccggttaag acacgactta tcgccactgg 1440
cagcagccac tggtaacagg attagcagag cgaggatatgt aggcgggtgct acagagttct 1500
tgaagtgggtg gcctaactac ggctacacta gaagaacagt atttggtatc tgcgctctgc 1560

| | |
|---|------|
| tgaagccagt taccttcgga aaaagagttg gtagctcttg atccggcaaa caaaccaccg | 1620 |
| ctggtagcgg tgggtttttt gtttgcaagc agcagattac gcgcagaaaa aaaggatctc | 1680 |
| aagaagatcc tttgatcttt tctacggggc tagcgcttag aagaactcat ccagcagacg | 1740 |
| gtagaatgca atacgttgag agtctggagc tgcaatacca tacagaacca ggaaacggtc | 1800 |
| agccccattca ccaccagtt cctctgcaat gtcacgggta gccagtgcaa tgtcctggta | 1860 |
| acggctctgca acaccagac gaccacagtc aatgaaacca gagaaacgac cattctcaac | 1920 |
| catgatgttc ggcaggcatg catcaccatg agtaactacc aggtcctcac catccggcat | 1980 |
| acgagctttc agacgtgcaa acagttcagc cggtgccaga ccctgatgtt cctcatccag | 2040 |
| gtcatcctgg tcaaccagac ctgcttccat acgggtacga gcacgttcaa tacgatgttt | 2100 |
| tgcttggtgg tcaaacggac aggtagctgg gtccagggtg tgcagacgac gcattgcac | 2160 |
| agccatgata gaaactttct ctgccggagc caggtgagaa gacagcaggt cctgacccgg | 2220 |
| aacttcaccc agcagcagcc agtcacgacc agcttcagta actacatcca gaactgcagc | 2280 |
| acacggaaca ccagtgggtg ccagccaaga cagacgagct gcttcacct gcaattcatt | 2340 |
| cagagcacca gacaggtcag ttttaacaaa cagaactgga cgaccctgtg cagacagacg | 2400 |
| gaaaacagct gcatcagagc aaccaatggt ctgctgtgcc cagtcataac caaacagacg | 2460 |
| ttcaaccag gctgccggag aacctgcatg cagaccatcc tgttcaatca tgcgaaacga | 2520 |
| tcctcatcct gtctcttgat cagatcttga tccccgccc catcagatcc ttggcggcaa | 2580 |
| gaaagccatc cagtttactt tgcagggtt cccaacctta ccagagggcg cccagctgg | 2640 |
| caattccggt tcgcttgctg tccataaaac cgcccagtct agcaactgtt gggaagggcg | 2700 |
| atcg | 2704 |

<210> 15
 <211> 2713
 <212> DNA
 <213> artificial sequence

<220>
 <223> Vector with a chicken codon optimized GHRH analog sequence

| | |
|--|-----|
| <400> 15 | |
| tgtaatacga ctactatag ggcgaattgg agctccaccg cggtggcggc cgtccgcct | 60 |
| cggcaccatc ctacgacac ccaaatatgg cgacgggtga ggaatggtgg ggagttat | 120 |
| ttagagcggg gaggaagggt ggcaggcagc aggtgttggc gctctaaaaa taactcccgg | 180 |
| gagttat | 240 |
| tcgccatatt tgggtgtccg ccctcggccg gggccgcatt cctggggggc gggcgggtgct | 300 |

| | |
|--|------|
| cccccccgcc tcgataaaaag gctccggggc cggcggcggc ccacgagcta cccggaggag | 360 |
| cgggaggcgc caagcggatc ccaaggccca actccccgaa ccaactcaggg tcctgtggac | 420 |
| agctcaccta gctgccatgg ccctgtgggt gttctttgtg ctgctgaccc tgacctccgg | 480 |
| aagccactgc agcctgccac ccagcccacc cttccgcgtc aggcgccacg ccgacggcat | 540 |
| cttcagcaag gcctaccgca agctcctggg ccagctgagc gcacgcaact acctgcacag | 600 |
| cctgatggcc aagcgcgtgg gcagcggact gggagacgag gccgagcccc tgagctgata | 660 |
| agcttatcgg ggtggcatcc ctgtgacccc tccccagtgc ctctcctggc cctggaagtt | 720 |
| gccactccag tgcccaccag ccttgtccta ataaaattaa gttgcatcat tttgtctgac | 780 |
| taggtgtcct tctataatat tatgggggtg aggggggtgg tatggagcaa ggggcaagtt | 840 |
| gggaagacaa cctgtagggc tcgagggggg gcccggtacc agcttttgtt ccctttagtg | 900 |
| agggttaatt tcgagcttgg tcttccgctt cctcgctcac tgactcgctg cgctcggtcg | 960 |
| ttcggctgcg gcgagcggta tcagctcact caaaggcggg aatacggtta tccacagaat | 1020 |
| caggggataa cgcaggaaaag aacatgtgag caaaaggcca gaaaaggcc aggaaccgta | 1080 |
| aaaaggccgc gttgctggcg tttttccata ggctccggcc ccctgacgag catcacaaaa | 1140 |
| atcgacgctc aagtcagagg tggcgaaacc cgacaggact ataaagatac caggcgtttc | 1200 |
| cccctggaag ctccctcgtg cgctctcctg ttccgaccct gccgcttacc ggatacctgt | 1260 |
| ccgcctttct cccttcggga agcgtggcgc tttctcatag ctcacgctgt aggtatctca | 1320 |
| gttcggtgta ggtcgttcgc tccaagctgg gctgtgtgca cgaaccccc gttcagcccg | 1380 |
| accgctgcgc cttatccggg aactatcgtc ttgagtccaa cccggtgaaga cacgacttat | 1440 |
| cgccactggc agcagccact ggtaacagga ttagcagagc gaggtatgta ggcggtgcta | 1500 |
| cagagttctt gaagtgggtg cctaactacg gctacactag aagaacagta tttggtatct | 1560 |
| gcgctctgct gaagccagtt accttcggaa aaagagttgg tagctcttga tccggcaaac | 1620 |
| aaaccaccgc tggtagcggg ggtttttttg tttgcaagca gcagattacg cgcagaaaaa | 1680 |
| aaggatctca agaagatcct ttgatctttt ctacggggct agcgcttaga agaactcatc | 1740 |
| cagcagacgg tagaatgcaa tacgttgaga gtctggagct gcaataccat acagaaccag | 1800 |
| gaaacgggta gcccatccac caccagttc ctctgcaatg tcacgggtag ccagtgcaat | 1860 |
| gtcctggtaa cggctctgcaa caccagacg accacagtca atgaaaccag agaaacgacc | 1920 |
| attctcaacc atgatgttcg gcaggcatgc atcaccatga gtaactacca ggtcctcacc | 1980 |
| atccggcata cgagctttca gacgtgcaaa cagttcagcc ggtgccagac cctgatgttc | 2040 |
| ctcatccagg tcatcctggg caaccagacc tgcttccata cgggtacgag cacgttcaat | 2100 |

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acgatgtttt gcctggtggt caaacggaca ggtagctggg tccaggggtgt gcagacgacg 2160
cattgcatca gccatgatag aaactttctc tgccggagcc aggtgagaag acagcaggtc 2220
ctgacccgga acttcaccca gcagcagcca gtcacgacca gcttcagtaa ctacatccag 2280
aactgcagca cacggaacac cagtgggtgc cagccaagac agacgagctg cttcatcctg 2340
cagttcattc agagcaccag acaggtcagt tttaacaaac agaactggac gaccctgtgc 2400
agacagacgg aaaacagctg catcagagca accaatgggc tgctgtgccc agtcataacc 2460
aaacagacgt tcaaccagg ctgccggaga acctgcatgc agaccatcct gttcaatcat 2520
gcgaaacgat cctcatcctg tctcttgatc agatcttgat cccctgcgcc atcagatcct 2580
tggcggcaag aaagccatcc agtttacttt gcagggcttc ccaaccttac cagagggcgc 2640
cccagctggc aattccggtt cgcttgctgt ccataaaacc gccagtccta gcaactgttg 2700
ggaagggcga tcg 2713

```

```

<210> 16
<211> 382
<212> DNA
<213> artificial sequence

```

```

<220>
<223> This is the synthetic promoter c1-26.

```

```

<400> 16
ggcggccgag ggcggcgggg caggcagcag gtgttggcac cattcctcac cgctctaaaa 60
ataactcccg tgaggaatgg tgccgtcgcc atatttgggt gtcgacaccc aaatatggcg 120
acgggtgagg aatggtgggc aggcagcagg tggtgggaca cccaaatatg gcgacggcca 180
acacctgctg cctgccggga gttattttta gagcggggag ttattttttag agcggtgagg 240
aatggtggac acccaaatat ggcgacggcc ggggccgcat tcctgggggc cgggcggtgc 300
tcccgccgc ctcgataaaa ggctccgggg ccggcggcgg cccacgagct acccggagga 360
gcgggagggc ccaagctcta ga 382

```

```

<210> 17
<211> 218
<212> DNA
<213> artificial sequence

```

```

<220>
<223> This is the synthetic promoter sequence for c2-26.

```

```

<400> 17
cggccgtcgc catatttggg tgtccgctct aaaaataact cccgacaccc aaatatggcg 60
acggggcagg cagcaggtgt tgggacaccc aaatatggcg acggccgggg ccgcattcct 120

```

ggggggccggg cgggtgctccc gcccgcctcg ataaaaggct ccggggccgg cggcggccca 180
cgagctaccc ggaggagcgg gaggcgcca gctctaga 218

<210> 18
<211> 230
<212> DNA
<213> artificial sequence

<220>
<223> This is the synthetic sequence for c2-27.

<400> 18
cggccgtcgc catatttggg tgcggcagg cagcagggtg tggcaccatt cctcaccgt 60
cgccatattt ggggtgcggc aggcagcagt gttgggacac ccaaatatgg cgacggccgg 120
ggccgcattc ctggggggccg ggcggtgctc ccgcccgcct cgataaaagg ctccggggcc 180
ggcggcggcc cacgagctac ccggaggagc gggaggcgcc aagctctaga 230

<210> 19
<211> 231
<212> DNA
<213> artificial sequence

<220>
<223> This is the synthetic promoter for c5-5.

<400> 19
cggccgtccg ccctcgggac acccaaatat ggcgacgggt gaggaatggt gcaccattcc 60
tcacgggagt tattttttaga gcggtgagga atggtggaca ccaaatatg gcgacggccg 120
gggcccatt cctggggggcc gggcggtgct ccgcccgcct tcgataaaag gctccggggc 180
cggcggcggc ccacgagcta ccgaggag cgggaggcgc caagctctag a 231

<210> 20
<211> 255
<212> DNA
<213> artificial sequence

<220>
<223> This is the synthetic promoter for c6-5.

<400> 20
cggccgtcgc catatttggg tgtcccaaca cctgctgcct gcccgcgc catatttgg 60
gtcggcaggc agcagggtgtt ggccaacacc tgctgcctgc cgggagttat ttttagagcg 120
gacacccaaa tatggcgacg gccggggccg cattcctggg ggccggggcg tgctcccgcc 180
cgctcgata aaaggctccg gggccggcgg cggccacga gctaccgga ggagcgggag 240
gcgccaagct ctaga 255

<210> 21
<211> 283
<212> DNA
<213> artificial sequence

<220>
<223> This is the synthetic promoter for c6-16.

<400> 21
cggccgtcgc catatttggg tgtccgctct aaaaataact cccccaacac ctgctgcctg 60
ccccgtcgcc atatttgggt gtcggcaggc agcaggtgtt ggccaacacc tgctgcctgc 120
ccaacacct gctgcctgcc ccgtcgccat atttgggtgtc cgccctcggc cggggccgca 180
ttcctggggg ccggggcggg ctcccgcccg cctcgataaa aggctccggg gccggcggcg 240
gccacgagc taccggagg agcgggaggc gccaagctct aga 283

<210> 22
<211> 263
<212> DNA
<213> artificial sequence

<220>
<223> This is the synthetic promoter for c6-39.

<400> 22
cggccgtccg ccctcggggg agttattttt agagcgccaa cacctgctgc ctgccccgtc 60
gccatatttg ggtgtcggca ggcagcaggt gttgggggag ttatttttag agcgccgtcg 120
ccatatttgg gtgtcccgag ggcggacggc cggggccgca ttcctggggg ccgggcgggtg 180
ctcccgcccg cctcgataaa aggctccggg gccggcggcg gccacgagc taccggagg 240
agcgggaggc gccaagctct aga 263